Burns & McDonnell
SINCE 1898

MEMORANDUM

Date: September 19, 2005

To: Terry Graumann

From: Robynn Andracsek

Regarding: Response to August 23, 2005 BACT Cost Questions from SDDNR

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1) As I leisurely read through the application, I have come across a few discussions stating a control technology is too costly and I am unable to find the supporting document for these conclusions. As such, I would like a copy of the "cost" analysis that was used to derive these statements. For example, the application notes that carbon monoxide controls for the fire pump and diesel generator and for sulfuric acid mist (H_2SO_4) for the main boiler were too costly. If there are other discussion on why a control technology is not "cost" effective that I have not touched upon, I would also like the cost analysis supporting those statements as well.

For Big Stone II, the total capital investment associated with the installation of a wet ESP is \$58.9 million and the annual operating cost is \$9.7 million. Assuming that the wet ESP could achieve a 50 percent control efficiency applied to the outlet flue gas from the wet scrubber, the wet ESP will remove approximately 65.7 ton H_2SO_4/yr. This corresponds to a cost effectiveness (\$/ton H_2SO_4 removed) of \$147,900/ton. Therefore, the annualized cost effectiveness is well above an acceptable level of cost effectiveness for these controls.

Add-on controls for CO on the emergency fire pump are estimated to have a total capital investment of \$49,000 and a total annualized cost of \$11,900. Assuming the catalyst system had a removal efficiency of 80 percent and operated 500 hours per year the system would remove 0.62 ton CO per year. This equates to a cost effectiveness of \$15,200 per ton of CO removed, making them economically infeasible for diesel engines of this size.

Add-on controls for CO for the diesel generator are estimated to have a total capital investment of \$76,000 and a total annualized cost of \$22,000. Assuming the catalyst system had a removal efficiency of 80 percent and operated 400 hours per year the system would remove 2.04 ton CO per year. This equates to a cost effectiveness of \$10,900 per ton of CO removed, making them economically infeasible for diesel engines of this size.

2) Your application proposed a PM_{10} BACT limit that included both filterable and condensable PM_{10} emissions. In addition, the application discusses an issue of "artifact" error in testing for the condensable portion of the PM_{10} emissions. To give me some flexibility in my BACT review, I would like Otter Tail to propose a BACT limit solely for *the filterable portion of the PM_{10} emissions. To clarify, this proposal would be in addition to your proposed BACT limit and not a replacement of your proposed BACT limit.*

Big Stone proposes a limit of 0.015 lb/MMBtu for PM_{10} filterable only for Big Stone II.

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AIR QUALITY
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OTTERTAIL
POWER COMPANY

September 21, 2005

Mr. Kyrik Rombough
Air Quality Program
South Dakota Department of Environment
and Natural Resources
Joe Foss Building
523 East Capitol
Pierre, SD 57501-3181

Dear Mr. Rombough:

Subject: Prevention of Significant Deterioration Construction Permit Application
Big Stone II – Revised Fire Pump Location

It was discovered that the Prevention of Significant Deterioration Construction Permit Application for the addition of Big Stone II was based on an incorrect location for the new fire pump.

Enclosed is a September 8, 2005 memo and accompanying tables from Burns & McDonnell that describes the corrections to the fire pump location.

Sincerely,

Terry Graumann
Manager, Environmental Services

Enclosures

C. Robynn Andracsek – B & McD

Burns & McDonnell
SINCE 1898

MEMORANDUM

Date: September 8, 2005

To: Terry Graumann

From: Robynn Andracsek

Regarding: BSII Modeling with Correct Fire Pump Location

The location of the new fire pump as modeled with the Prevention of Significant Deterioration (PSD) application submitted in August 2005 was mistakenly modeled in the wrong location. The correct coordinates are 694,981.25 meters East, 5,020,063.5 meters North (UTM NAD 27). The location in the original model was 694,333.34 meters East, 5,020,100.28 meters North (UTM NAD 27). The fire pump building was also moved to the corresponding, correct location.

The model was rerun and, as expected, there was an insignificant change in the modeled results. The corrected modeling results are shown in Tables 6-5, 6-6, and 6-7 below. (Table numbers correspond to the August 2005 application.) The August 2005 values are shown in parentheses wherever a change occurred.

The revised modeling files are available upon request.

Table 6-5: Screening Level Maximum Modeled Concentrations

Pollutant	Averaging Period	UTM Coordinates (meters) East	UTM Coordinates (meters) North	Year	Predicted Concentration ($\mu g/m^3$)	Significance Level ($\mu g/m^3$)
CO	1-hour	694965.5	5019243.00	2002	757.93	2,000
	8-hour	694965.5	5019243.00	2002	119.73 (119.75)	500
PM_{10}	24-hour	694675.6 (694675.5)	5020015	2002	**35.19**	5
	Annual	694965.5	5019243	2004	**5.39 (5.38)**	1

Table 6-6: PM_{10} NAAQS Modeling Results ($\mu g/m^3$)

Averaging Period	NAAQS	Maximum Modeled Impact: All NAAQS Sources				Background Concentration	Total Concentration
		Easting	Northing	Year	Concentration		
24-hour	150	694965.50	5019243.0	2002	105.41 (104.74)	32.0	137.41 (136.74)
Annual	50	694965.50	5019243.0	2002	19.35	12.1	31.45

Table 6-7: PM_{10} Increment Modeling Results ($\mu g/m^3$)

Averaging Period	PSD Increment	Maximum Modeled Impact: All NAAQS Sources			
		Easting	Northing	Year	Concentratio
24-hour	30	694752.9	5020110	2002	29.64
Annual	17	694965.5	5019243	2004	5.39 (5.38)